GIS day

UNIVERSITY OF ALBERTA

UofA's GIS Day 2019

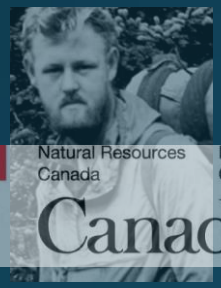
GIS, Storytelling, and Free Stuff!

https://www.youtube.com/watch?v=nAEno-caLDY

What is… ?

GIS

Geographical
Information
System



Dr. Roger Tomlinson

Natural Resources Canada | Ressources naturelles Canada

Canada

People

Hardware | Analysis

GIS

Software | Data

Geography

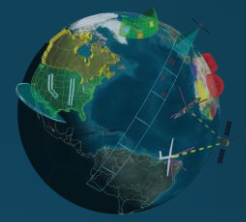
"Geography is the study of places and the relationships between people and their environments.

Geographers explore both the physical properties of Earth's surface and the human societies spread across it. They also examine how human culture interacts with the natural environment and the way locations and places can have an impact on people.

Geography seeks to understand where things are found, why they are there, and how they develop and change over time."

NATIONAL GEOGRAPHIC

Geospatial



The collective data and associated technologies that have a geographic or locational component.

Geospatial data records have locational information tied to them such as geographic data in the form of coordinates, an address, a city, or a postal code.

Geospatial technologies (GIS, remote sensing, GPS, web mapping) acquire, manipulate, store, and visualize geographic information.

https://www.youtube.com/watch?v=LHDCRjAxpIo

Today's Program

- UofA's GIS Resources
  - Labs, software, and other useful stuff
  - ArcGIS Online: UofA's subscription for organizations - get signed up today
- Must-Know Online GIS Resources
  - Community Map of Canada
  - Living Atlas of the World
  - StoryMaps
- ChEHC and ACE Lab online atlases
- Call for Participation
- Links to Learning

UofA's GIS Resources

Research Labs

ALES - Rick Pelletier
https://www.ualberta.ca/agriculture-life-environment-sciences/about-us/contact-us/facultylecturer-directory/rick-pelletier

ARTS - Kisha Supernant
https://sites.ualberta.ca/~supernan/gis-lab.html

SCIENCES - Arturo Sánchez-Azofeifa
https://www.ualberta.ca/faculties/centresinstitutes/centre-for-earth-observation-sciences

Software

https://ist.ualberta.ca/services/labs-classrooms/lab-details

Lab Name	Seating	Operating System	Location
Biological Sciences CW-403	24	Windows 10 - VDI	Map
General Services Building 2-17	30	Windows 10 - VDI	Map
General Services Building 8-66	32	Windows 10 - VDI	Map
Rutherford Library South 2-03	30	Windows 10 - VDI	Map
Rutherford Library South 2-05A	16	Windows 10 - VDI	Map

https://ualberta.onthehub.com/
→ GIS/Graphics → Students

Useful Stuff

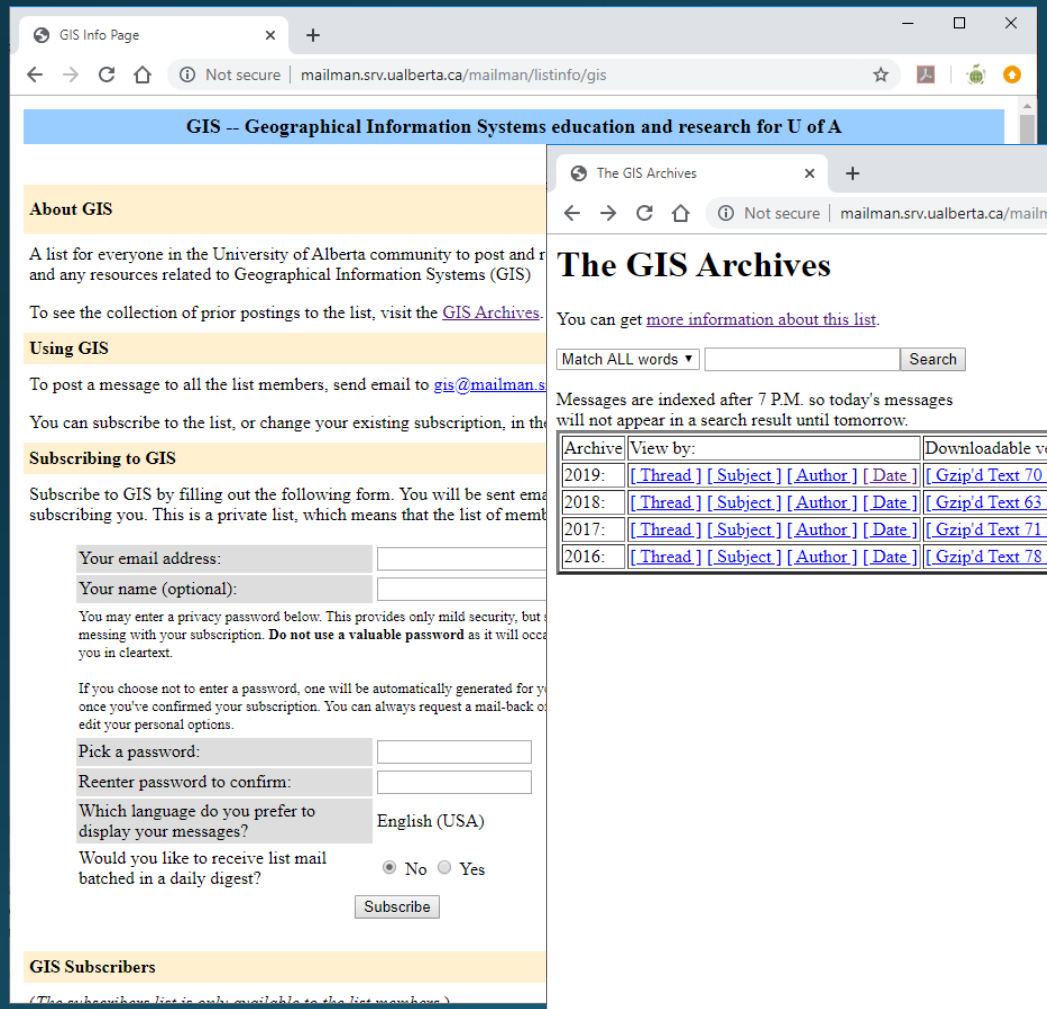
Geospatial Data Services Librarian
- Larry Laliberté
https://guides.library.ualberta.ca/geospatial-data-maps

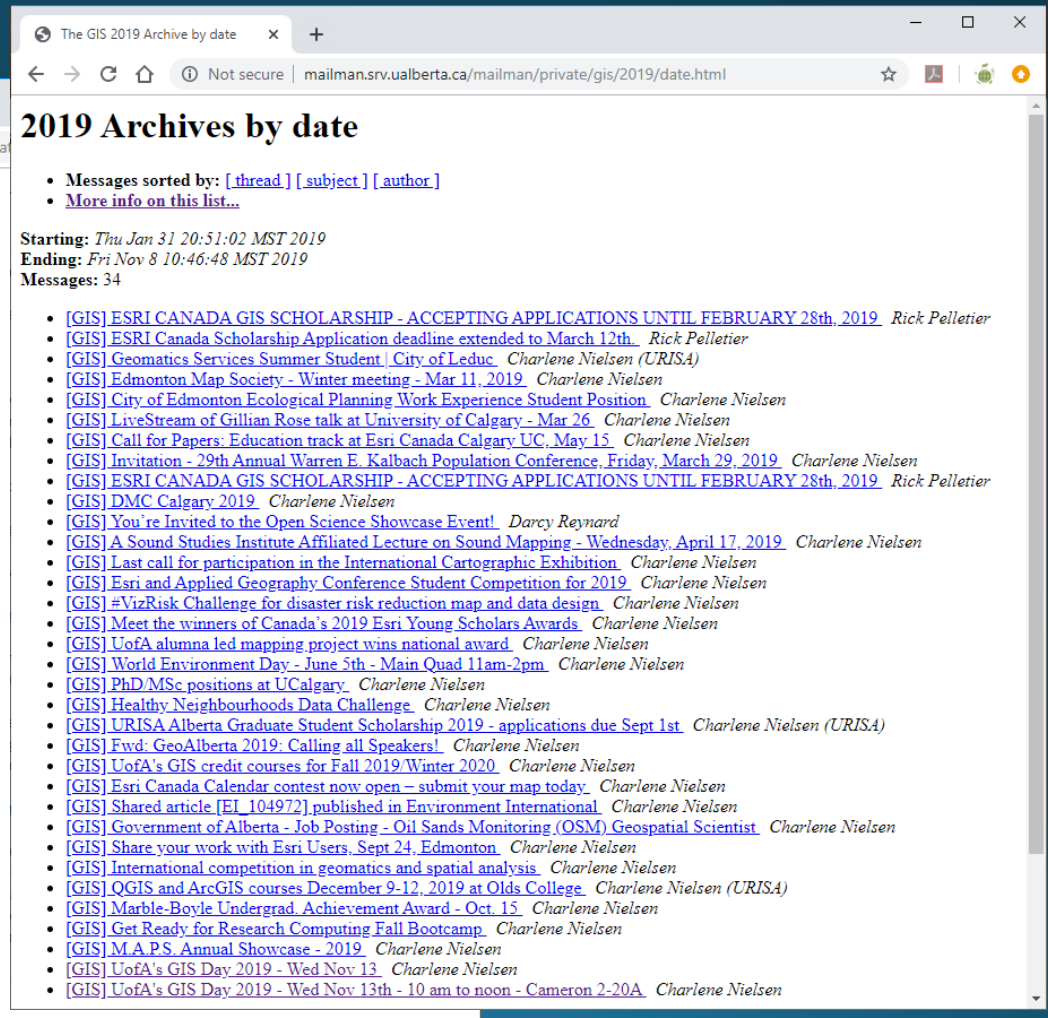
Dec 2019-Jul 2020

The GIS List
http://www.mailman.srv.ualberta.ca/mailman/listinfo/gis

Scholarships
- http://www.urisab.org/sponsorship/
- https://scholars.esri.ca/

http://www.mailman.srv.ualberta.ca/mailman/listinfo/gis



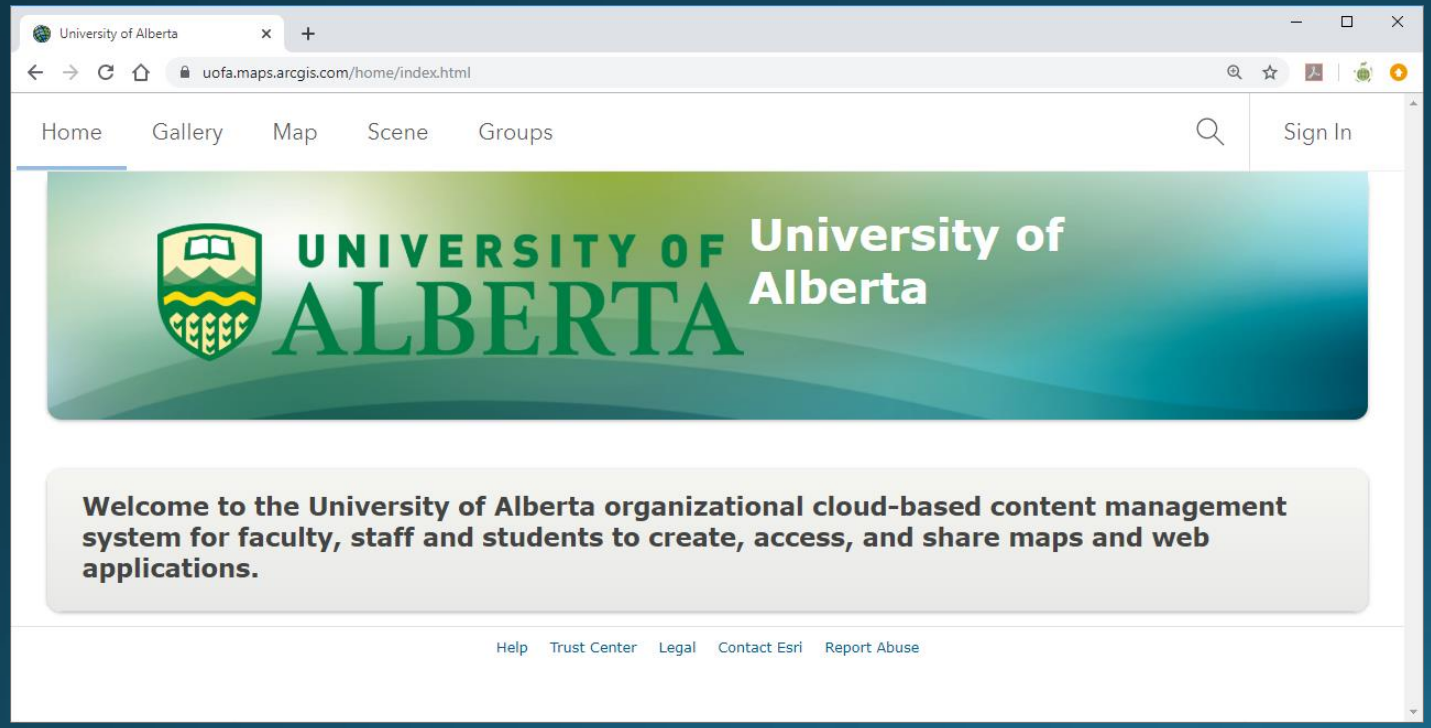


https://www.youtube.com/watch?v=FRcv9xmmojE

ArcGIS Online
UofA's Subscription

- Two types of ArcGIS Online accounts:
  - Free public account for your personal use
  - Subscription for organizations
- Benefits of a subscription account:
  - Esri Access enabled – help and training
  - ArcGIS Pro – your license to activate
  - Keep your content private
  - Share content with specific groups
  - Make your content public
  - Analysis!
- https://www.arcgis.com/index.html

ArcGIS Online
Get Signed Up Now!



- Do you:
  - Already have an account?
  - Wish to get signed up?
- I will:
  - Reset your password, if you forgot it
  - Edit spreadsheet, sign in with administrator account, and upload new invitees
- In the winter we will hold a workshop in the DSC to learn to use online mapping

https://www.youtube.com/watch?v=aBgF_gDqSKE

https://www.youtube.com/watch?v=cMoCgnEBdgE

Must-Know Online GIS Resources

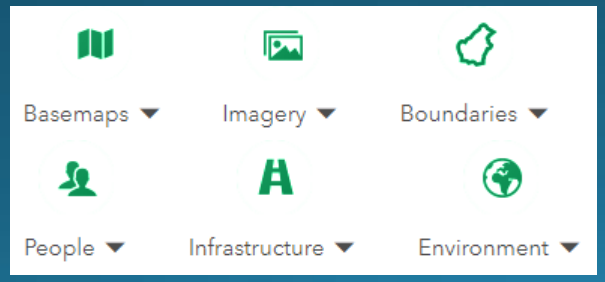
Community Map of Canada

"…is a basemap of Canada built from authoritative data, collected closest to source and updated daily. Seamlessly created to one common specification and compliant with international standards, it provides unrestricted access to community maps and imagery across the country."

https://www.arcgis.com/home/item.html?id=98652eb8458a464fa95feb9bd812b29a

Living Atlas

https://livingatlas.arcgis.com/en/browse/#d=2



Story Maps

https://esri.ca/en/storytelling-with-maps

https://www.youtube.com/watch?v=o81xkoklQgs

StoryMaps for Online Atlas #1

ChEHC

Map Collection

https://arcg.is/19XyXn0

A Medical Macroscope for Children's Environmental Health: The ChEHC Map Collection

Charlene Nielsen,
Osnat Wine, Lesley Brennan,
Irena Buka, Carl Amrhein,
Alvaro Osornio-Vargas

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Definition of environmental health in English:

environmental health

NOUN

[mass noun]

1 The branch of public health concerned with monitoring or mitigating those factors in the environment that affect human health and disease.

[as modifier] *'air pollution is a huge environmental health issue'*

1.1 The condition of the environment in a particular region, especially as regards ecological diversity or pollution.

'the analysis focused on 18 seabird species that are indicators of the environmental health of Puget Sound'

Children are at greater risk of environmental contaminants because they are still growing

- Children breathe more air, drink more water, and eat more food per pound of body weight than adults.

- Children are more likely to put their hands in their mouth.

- A child's body may not be able to break down and get rid of harmful contaminants that enter their body.

- Because they are young, children have more time to develop health conditions and diseases from environmental exposures than adults who are exposed later in their life.

https://ephtracking.cdc.gov/showChildEHResources

Environmental exposures impact all aspects of child development from *in utero* to early childhood

Adverse child health outcome:

- acute respiratory illnesses and infections (bronchitis, sinusitis)
- alterations in the immune system
- asthma
- behavioral disorders (ADHD, autism)
- birth defects (aortic/pulmonary artery/valve)
- childhood cancers
- deficits in lung growth and function
- impaired mental and motor development
- intrauterine growth retardation
- low birth weight
- premature birth
- reduced birth length
- reduced head circumference
- small for gestational age
- stillbirth
- sudden infant death syndrome

Environmental exposures:

- air pollution
- water pollution
- hazardous wastes
- radiation
- climate change

Technology & Science

Harmful air pollution 'definitely too high for the public' near city roads, study suggests

Growth in SUVs, pickup truck sales blamed for rising 'non-tailpipe' emissions

Emily Chung · CBC News · Posted: Oct 30, 2019 8:30 AM ET | Last Updated: October 31

- Greg Evans, director of the Southern Ontario Centre for Atmospheric Aerosol Research at the University of Toronto
- Especially at rush hour, in winter, and poorly maintained diesel trucks (growth in online shopping and delivery)
- Nearly 30 per cent of Canadians live within 250 metres of a major roadway

Monitoring

National Air Pollution Surveillance Program (NAPS)

- Standard, accurate, long-term air quality data, established in 1969
- Continual measurements of 5 select substances:
  SO_2, NO_2, O_3, PM and CO
- Monitor and assess the quality of outdoor air in the populated regions of Canada
- Used in the **Air Quality Health Index (AQHI)**

The Air Quality Health Index (AQHI) helps communicate the air quality in an area, using a scale from 1 to 10, and what it means to your health

Health Risk	AQHI	Health Messages	
		At Risk Population*	General Population
Low	1 - 3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.
Moderate	4 - 6	Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High	7 - 10	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High	Above 10	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

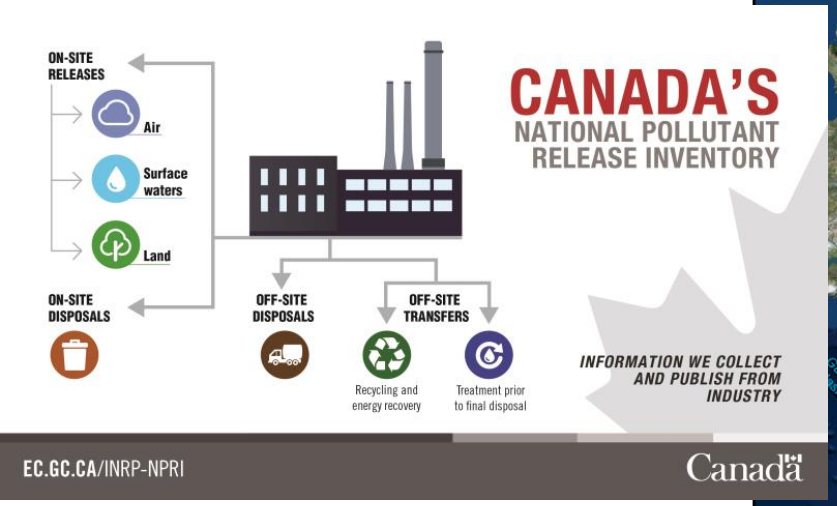
http://airquality.alberta.ca/map/

* People with heart or breathing problems are at greater risk. Follow your doctor's usual advice.

Inventory

National Pollutant Release Inventory (NPRI)

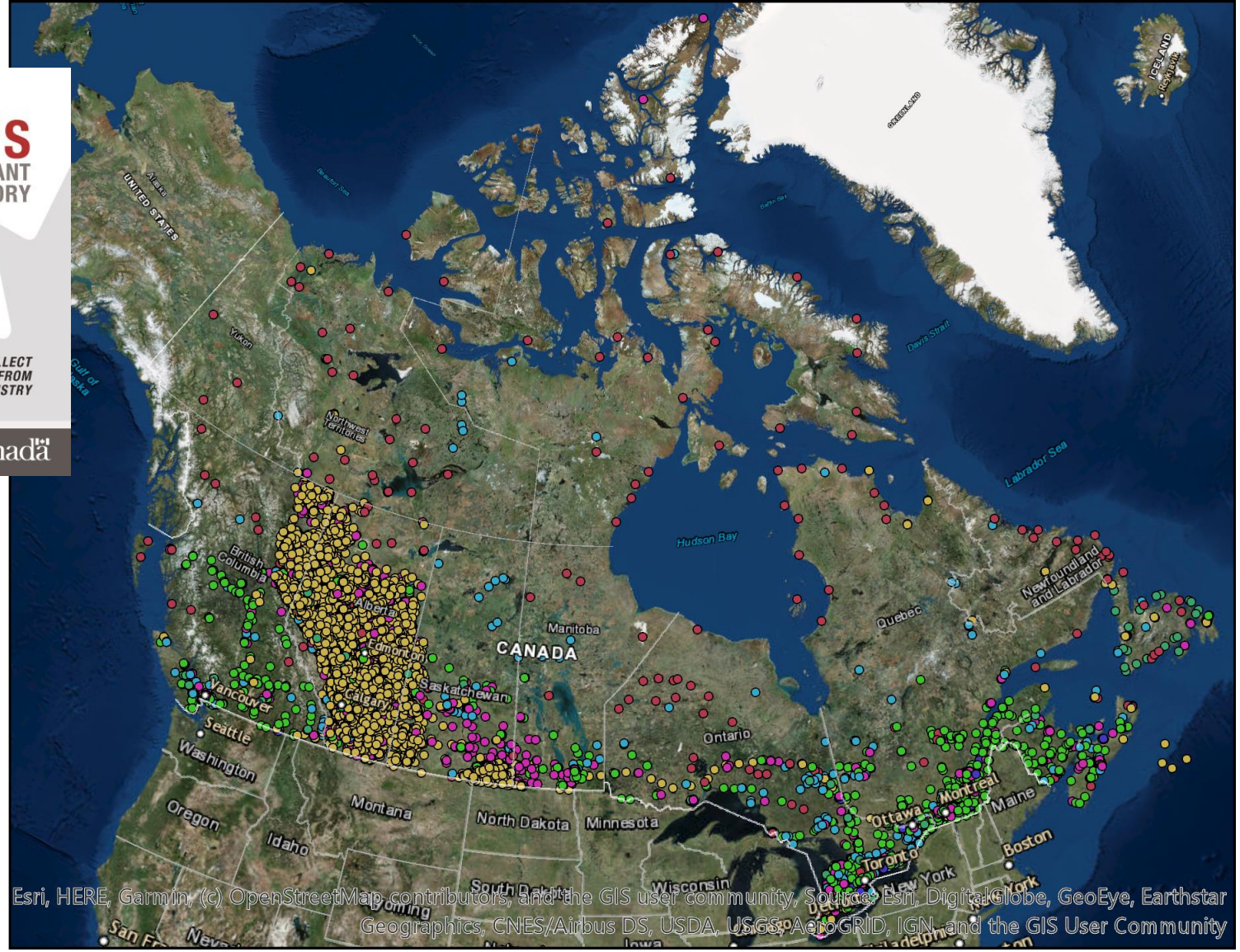
- Canadian Environmental Protection Act (CEPA) in1999
- Annual estimates of facility-based releases to air, water and land of over 300 select substances
- Most significant point-sources
- A starting point for better understanding how pollutants are entering the Canadian environment



NPRI 2006-2012

General Sector

- Electricity
- Manufacturing
- Metals
- Mining
- Oil and Gas
- Other
- Waste



Alberta, 2006-2012

136 chemicals emitted to air

- 47 carcinogens
- 35 developmental toxicants
- 20 immunotoxicants

WE ALL HAVE A PART TO PLAY
IN PROTECTING CHILDREN FROM DIRTY AIR

Air pollution can be fought on many fronts

HOUSES

Use of clean cook stoves for cooking

CLINICS

MUNICIPALITIES

INSTITUTIONS

NATIONAL GOVERNMENT

GLOBAL COMMUNITY

SCHOOLS

HEALTH PROFESSIONALS ARE UNIQUELY PLACED TO TAKE ACTION ON AIR POLLUTION

- Be informed
- Recognize exposure and related health conditions
- Prescribe solutions, and educate families, communities, colleagues and students
- Advocate solutions to other sectors, policy- and decision-makers
- Research, publish and disseminate knowledge

The broader health sector must become more engaged

CLEAN AIR FOR CHILDREN'S HEALTH *#AirPollution* World Health Organization

Microscope

Telescope

Macroscope

Geographical Information Systems (GIS)

Elements — Extraterrestrial

see smaller particles and cells — *see farther away into space*

Children's Environmental Health Clinic (ChEHC)

A World Health Organization (WHO) Collaborating Centre in Children's Environmental Health

- Unique program addressing the impacts on children's health from environmental exposures:
  Chemical, Biological, Physical, and Social
- Three branches:
  Clinical Services, Education, and Research
- Here in Edmonton
- We have created an **online atlas** of air pollution for their use

https://www.chehc.ca

ChEHC

Map Collection

https://arcg.is/19XyXn0

Acknowledgments

- DoMiNO Project - CIHR/NSERC CHRP 2013-2018
- ChEHC
- NPRI
- City of Edmonton Open Data
- Statistics Canada Road Network File
- Esri's ArcGIS StoryMaps

women & children's health research institute

STOLLERY CHILDREN'S HOSPITAL FOUNDATION

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StoryMaps for Online Atlas #2

Landscape Rarity

Jacqueline Dennett, Charlene Nielsen, Scott Nielsen

www.ace-lab.org

Sketches Here and There

A Conservation Blog from the University of Alberta

Mapping landscape rarity in Alberta's boreal plants

Relative to other systems, the boreal forest is species poor with low rates of endemism. However, many rare and uncommon species occur in northeastern Alberta, and their conservation is dependent on understanding where these plants are likely to be on the landscape. From 2011 to 2015, Dr. Nielsen, in collaboration with the Alberta Biodiversity Monitoring Institute, designed and oversaw a terrestrial vascular plant monitoring program designed to target rare species.

Rare species, as you may expect, are inherently difficult to survey. Knowledge of occurrences, species ecology, and population dynamics are often lacking, particularly in areas like the boreal where survey effort tends to be low due to difficult ground and poor accessibility. Dr. Nielsen used an iterative, model-based approach to sampling, where landscape factors such as terrain and soil pH were used to predict areas that were most, and least, likely to contain rare species. Over four years, we sampled 602 unique plots and found 42 populations of nine rare species. Uncommon species (those ranked at S3) were found at nearly 100% of plots, clearly demonstrating the advantages of model-directed sampling.

The data produced by this project are publicly available and have been used in multiple manuscripts from the ACE Lab and colleagues to date. To read more about the boreal forest, rare plants, and the details of this extensive sampling effort, check out our new, interactive StoryMap, "Landscape Rarity"!

https://uofa.maps.arcgis.com/apps/Cascade/index.html?appid=cf214263b9f447c0abf71b665cc79904

Boreal forest and rare plants meet field sampling, GIS modeling, and online mapping

- Researcher's photographs, open access images, GIS datasets, spatially modeled data, and textual information were curated and organized in the following sections:
  - Introduction – all about the Boreal
  - Project – monitoring rare plant species
  - Prevalence – results of the field sampling
  - Model – results of the GIS models
  - Rarity – more info on what makes a plant rare
  - Richness – more info on measuring species abundance
  - Habitats – more info on the variety of Boreal landscapes
  - Remarks – conclusions and funding
  - References – literature cited
- Individual maps and apps were created and then assembled in the StoryMap

https://arcg.is/1mmL0L

https://www.youtube.com/watch?v=8wY14zHDmEs

Call for Participation

- Help create a new GIS website as a StoryMap https://sites.ualberta.ca/~gis/
  - UofA's online maps
  - UofA's research publications that used GIS
- Email ccn@ualberta.ca – use the subject "UofA GIS StoryMap" – with web links and descriptive content about any online maps or publications by the UofA community
  - Campus maps
  - Google Maps or other online mapping application
  - Class projects
  - Atlases (e.g. ChEHC and ACE Lab)
  - Journal articles

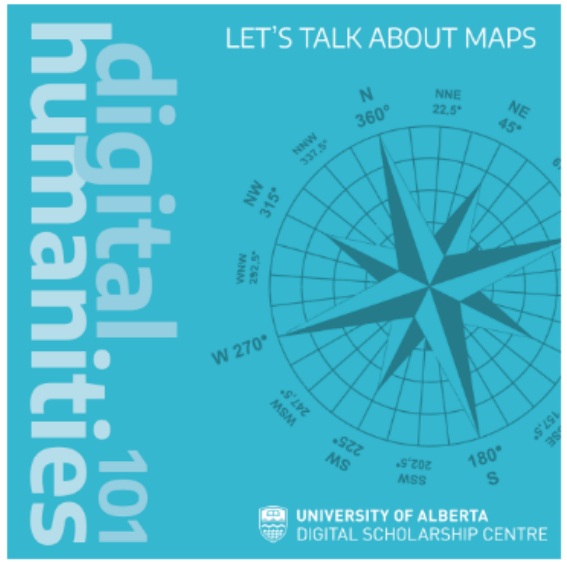
If they are public then we can link to them

- Requirements:
  - Maps: NO WEB LINKS TO PDFs OR STATIC IMAGES - MUST BE INTERACTIVE
  - Publications: MUST BE PUBLISHED AND HAVE A DOI WEB LINK https://sites.ualberta.ca/~ccn/
- Due by Dec 20, 2019
- In the winter we will hold a small workshop in the DSC to assemble the StoryMap

Links to Learning

- ArcGIS Online
  - https://www.esri.com/en-us/arcgis/products/arcgis-online/resources
  - https://learn.arcgis.com/en/projects/get-started-with-arcgis-online/
  - www.esri.com/training/Bookmark/P3D2Z6MDF
  - https://www.esri.com/arcgis-blog/arcgis-online/
- StoryMaps
  - https://www.esri.com/en-us/arcgis/products/arcgis-storymaps/overview
  - https://learn.arcgis.com/en/projects/get-started-with-story-maps/
  - www.esri.com/training/Bookmark/PKUUZRMDP
  - https://www.esri.com/arcgis-blog/story-maps/
- Living Atlas
  - https://livingatlas.arcgis.com/en/
  - https://learn.arcgis.com/en/paths/using-living-atlas/
  - www.esri.com/training/Bookmark/FK68Y6MDF
  - https://www.esri.com/arcgis-blog/arcgis-living-atlas/
- Community Map of Canada
  - https://esri.ca/en/programs/the-community-map-of-canada
  - https://exchange.maps.arcgis.com/home/index.html
  - https://esri.ca/en/events/webinars/power-your-basemap-with-the-community-map-of-canada
- The ArcGIS Book
  - https://learn.arcgis.com/en/arcgis-book/

https://ualberta.libcal.com/event/3526464?hs=a



Digital Scholarship 101 - Let's Talk About Maps

An introduction to mapping, map conventions, and Q-GIS (a free open source GIS software). The workshop will include discussion, and hands-on activities. Participants are encouraged to bring their own laptops and to have downloaded and installed Q-GIS (version 3.4 is the recommended long-term release). No prior knowledge of GIS is needed.

This is part of a four week Digital Scholarship series of introductory workshops hosted by the Digital Scholarship Centre. Students, faculty, and staff are all welcome to attend. Participants are encouraged to attend multiple workshops in this series.

Instructor: Kate Cawthorn

Date:	Thursday, November 21, 2019
Time:	4:00pm - 6:00pm
Location:	2-20A
Campus:	Digital Scholarship Centre

Begin Registration

https://www.youtube.com/watch?v=y9ptLTiJT6g

Free Stuff!

WINNERS

Personal-Use ArcGIS License:

1. Aiyu Huang
2. Michaela Kleinsasser
3. Radha Adhikari
4. Shannon Marvin
5. Morgan Wilson

Thanks to the GIS Day Team

ArcGIS Pro Book: Jared Geiger

Thanks to UAlberta North

https://wheelofnames.com

GIS day

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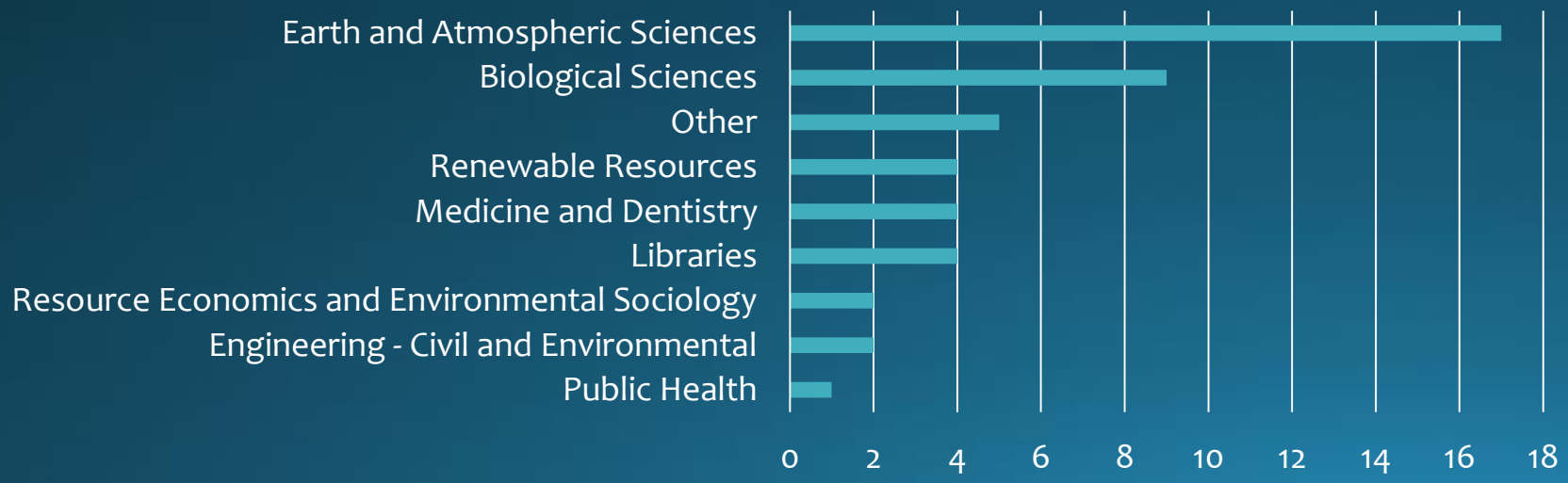

Wed Nov 13, 2019